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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/577,880

04/28/2006

Michelle Miller

HAM 830019/USw

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06/21/2010

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EXAMINER

NERANGIS, VICKEY MARIE

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

06/21/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,880	Applicant(s) MILLER, MICHELLE	
	Examiner Vickey Nerangis	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 15, 17, 18, 21-23 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) 27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14, 15, 17, 18, 21-23, 25 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. All outstanding rejections, except for those maintained below, are withdrawn in light of applicant's amendment filed on 3/5/2010.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.
3. The new grounds of rejection set forth below are necessitated by applicant's amendment filed on 3/5/2010. In particular, claim 14 has been amended to incorporate the limitation of now-cancelled 24. Thus, the following action is properly made final.

Claim Rejections - 35 USC § 112

4. Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is dependent on cancelled claim 24.

Claim Rejections - 35 USC § 103

5. Claim 14, 15, 17, 18, 21, 22 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinnavaia (US 5,760,106) in view of Zilg (US 6,197,849).

Pinnavaia discloses epoxy resin-clay composites comprising epoxy resin and an organoclay that has been ion-exchanged with alkyl(3-22) ammonium halide (col. 4, lines 58-60) having a 1 nm layer thickness and aspect ratio of 2,000:1 to 20:1 (col. 4, lines 53-56). The ratio of epoxy to clay is between 100:1 to 1:1 (col. 4, lines 14-16). The epoxy resin includes epoxy resin precursor and amine curing agent such as JEFFAMINES (col. 5, lines 62-67). Note

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example E25 which mixes epoxy resins and JEFFAMINE D200 containing $\text{CH}_3(\text{CH}_2)_{17}\text{NH}_3^+$ montmorillonite (col. 14, lines 48-52).

While Pinnavaia does not disclose that the epoxy resin precursor comprises a platelet filler, note that a mixture of epoxy resin precursor, amine curing agent, and platelet filler comprises two reactive resins and a platelet filler. Given that the instant claim language recites open transitional language “includes” (i.e., “at least two of the separate reactive components each includes nanoscale filler”), the separate reactive component can also comprise each other. Therefore, the epoxy resin precursor also comprises platelet filler.

Furthermore, concerning claim 15, note that the viscosity of the reactive is necessarily higher than the separate reactive components because the reactive components react resulting in increased molecular weight, thereby providing for higher viscosity.

Pinnavaia fails to disclose (i) the addition of a filler in addition to the platelet filler and (ii) the amount of layered platelet in each reactive component.

With respect to (i), Zilg discloses organophilic phyllosilicates comprising epoxy resin and teaches that fillers such as quartz (i.e., silica) and chalk (i.e., calcium carbonate) can be added to composite in an amount of up to 70 wt % of phyllosilicate (col. 10, lines 6-23).

Given that additional fillers can be added to the composite as taught by Zilg and further given that both Pinnavaia and Zilg are drawn to epoxy nanocomposites, it would have been obvious to one of ordinary skill in the art to add a known filler to the composite of Pinnavaia. Case law holds that the selection of a known material based on its suitability for its intended use supports *prima facie* obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

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With respect to (ii), Zilg also teaches that the organophilic phyllosilicates may be added to either the resin or the hardener (col. 10, lines 7-10) and that it is added in an amount of 0.5-30 wt % based on the resin or hardener.

Given that the platelet filler of Pinnavaia can be added to either the resin precursor or amine hardener in an amount of 0.5-30 wt % as taught by Zilg, it would have been obvious to one of ordinary skill in the art to add the platelet filler to both the resin precursor or amine hardener to obtain the same final product. It is well settled that it is *prima facie* obvious to combine two ingredients, each of which is targeted by the prior art to be useful for the same purpose. *In re Lindner* 457 F.2d 506, 509, 173 USPQ 356, 359 (CCPA 1972). Also, case law holds that “it is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art.” *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinnavaia (US 5,760,106) in view of Zilg (US 6,197,849) and further in view of Kobayashi (US 6,342,295) and Fitzgerald (US 2,887,458).

The discussion with respect to Pinnavaia and Zilg in paragraph 5 above is incorporated here by reference.

Pinnavaia exemplifies the use of Jeffamine D2000 and Epon 828 as reactive components but fails to disclose the viscosity of each reactive component or the reactive resin.

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Kobayashi teaches that Jeffamine D2000 has a viscosity of 342 cP (0.342 Pa s) (col. 14, lines 64-67), and Fitzgerald teaches that Epon 828 has a viscosity of approximately 12,500 cP (12.5 Pa s) (col. 3, lines 31-32). Upon combination of the Jeffamine D200, Epon 828, and platelet filler, the viscosity of the composition is expected to increase dramatically because amine and epoxy are very reactive towards each other resulting in both increased molecular weight and crosslinking.

Given that amine and epoxy are very reactive to each other and given the desirability of Pinnavaia to have an article with “superior tensile strength” (abstract), it would have been obvious to one of ordinary skill in the art to prepare an epoxy resin-clay composite that is solid and has viscosity of greater than 500,000 Pa s.

Response to Arguments

7. Applicant's arguments filed 3/5/2010 have been fully considered but they are not persuasive. Specifically, applicant argues that the combination of Pinnavaia and Zilg fails to disclose a filler that interacts with the platelet filler.

According to the specification, the fillers that interact with the platelet fillers include silica and calcium carbonate (page 9, lines 15-21). Because Zilg teaches these fillers in combination with platelet clay, they inherently interact with each other. Furthermore, the phrase “interacts with” has not been clearly defined in the specification so as to distinguish inherent interactions from purposeful interactions.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vickey Nerangis whose telephone number is (571) 272-2701. The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

vn

/Vickey Nerangis/
Primary Examiner, Art Unit 1796